

Algebra 2 MIDTERM - Quarter 3

Multiple Choice

Identify the letter of the choice that best completes the statement or answers the question.

Simplify the given expression.

1. $\left(15x^2 + 11xy - 19y^2\right) - \left(6x^2 - 3xy\right)$
 a. $9x^2 + 8xy - 19y^2$ b. $9x^2 + 14xy - 19y^2$ c. $9x^2 - 11xy - 16y^2$ d. $9x^2 - 14xy$
2. $20 \div 5 \cdot 2$
 a. 10 b. 2 c. 8 d. 4
3. $4 + \left[-2(4 - 1)\right]^2$
 a. -32 b. 40 c. -14 d. -2
4. $\sqrt{16} + \left\{10 \div \left[11 - (5 + 1)\right]\right\}$
 a. 5.43 b. 10 c. 6 d. 11
5. $\frac{-3 - \sqrt{3^2 - 4 \cdot 1 \cdot 2}}{2 \cdot 1}$
 a. -3.08 b. 2 c. -3.5 d. -2
6. $(15 \div 3 + 4) - \left(3^2 - 7 \cdot 2\right)$
 a. 14 b. 4 c. 17 d. 1
7. $2(x + 3y) - 3(4x + y)$
 a. $-10x + 6y$ b. $-10x + 3y$ c. $14x + 3y$ d. $-4x - 4y$

Evaluate the function.

8. Find $p(-3)$ for the function $p(x) = 3x^4 + 2x^3 - 7x^2 + 13x + 2$.
 a. -235 b. 89 c. 141 d. 87
9. Find the value of $f(-10)$ if $f(x) = -10x + 9$.
 a. $f(-10) = -30$ b. $f(-10) = 91$ c. $f(-10) = -1$ d. $f(-10) = 109$

10. Using $f(x) = 4x$ and $g(x) = x^2 - 2x + 5$, find $(f+g)(x)$

a. $(f+g)(x) = x^2 - 6x + 5$

c. $(f+g)(x) = 4x^2 - 8x + 20$

b. $(f+g)(x) = x^2 + 2x + 5$

d. $(f+g)(x) = 4x^2 + 2x + 5$

Find the slope.

11.

X	Y
-1	4
0	6
1	8

a. $\frac{1}{2}$

b. -2

c. 2

d. $-\frac{1}{2}$

12. $y - 2 = -\frac{1}{4}(x - 8)$

a. $-\frac{1}{4}$

b. 2

c. 8

d. -2

13. $x = -5$

a. -5

b. undefined

c. 0

d. $-\frac{1}{5}$

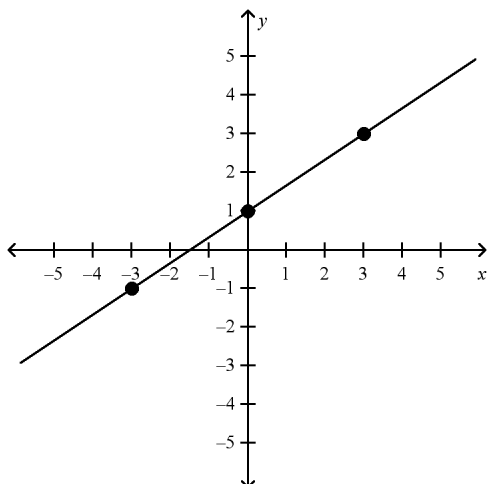
14. $y = 3$

a. 0

b. undefined

c. 1

d. 3



15.

- a. $\frac{3}{2}$ b. 1 c. $\frac{2}{3}$ d. $-\frac{2}{3}$

Solve the given formula for the specified variable.

16. $u = \frac{f}{t}$, for t

- a. $t = f$ b. $t = uf$ c. $t = \frac{u}{f}$ d. $t = \frac{f}{u}$

Write the equation of the line that satisfies the given conditions.

17. slope is 4, goes through the point $\left(0, -\frac{1}{3}\right)$

- a. $y = -\frac{1}{3}x + 4$ b. $y - \frac{1}{3} = 4(x - 0)$ c. $y - 0 = -\frac{1}{3}(x - 4)$ d. $y = 4x - \frac{1}{3}$

18. Goes through the points $(-2, 4)$ and $(0, 8)$

- a. $y = 2x + 4$ b. $y = 2x + 8$ c. $y = -2x + 4$ d. $y = -2x + 8$

19. Write an equation in slope-intercept form for the line that satisfies the following condition.
slope 4, and passes through $(2, 20)$

- a. $y = 20x + 12$ b. $y = 2x - 2$ c. $y = 4x - 20$ d. $y = 4x + 12$

20. Find $(f+g)(x)$ for the following functions.

$$f(x) = 14x^2 + 6x + 8$$

$$g(x) = 5x + 6$$

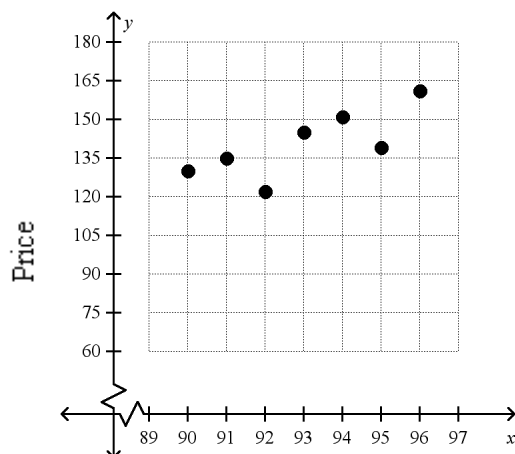
a. $14x^2 + 11x + 14$ b. $19x^3 + 12x + 8$ c. $14x^2 + 11x + 8$ d. $19x^2 + 12x + 8$

Answer the questions based on the following scenario.

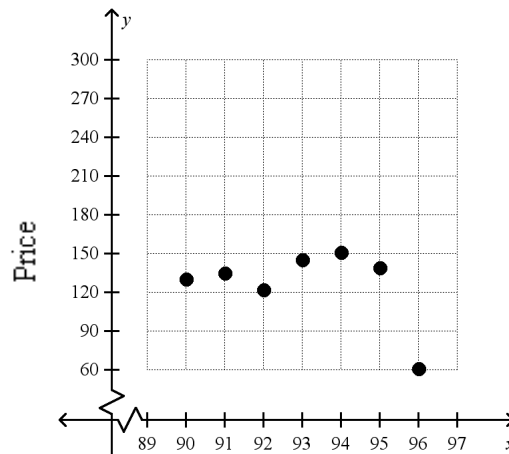
21. The school is hosting a car wash fundraiser to expand the athletic programs. \$35 is spent on supplies in preparation and the school earns \$3 for every car they wash. What are the independent and dependent variables in this situation?
- | | |
|--|--|
| a. independent: money raised
dependent: number of cars washed | c. independent: number of cars washed
dependent: money raised |
| b. independent: 35 dollars
dependent: 3 dollars | d. independent: supplies
dependent: fundraiser |
22. Write an equation that models the situation.
- a. $y = -3x - 35$ b. $y = 3x + 35$ c. $y = 35x + 3$ d. $y = 3x - 35$
23. How much money will the school have raised if we wash 100 cars at the car wash?
- a. \$300 b. \$265 c. \$335 d. \$3500

24. The table below shows the median selling price of houses in the 1990s. Draw a scatter plot based on the data.

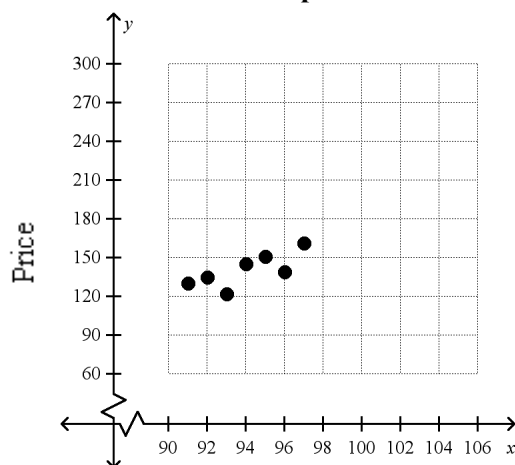
Year	1990	1991	1992	1993	1994	1995	1996
Price (\$ thousands)	130	135	122	145	151	139	61



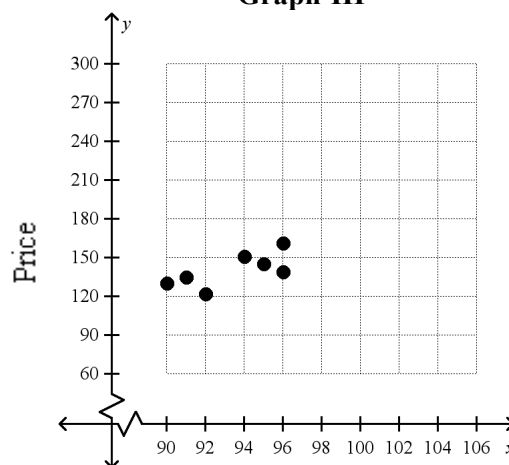
Graph I



Graph III



Graph II



Graph IV

- a. Graph I b. Graph II c. Graph III d. Graph IV

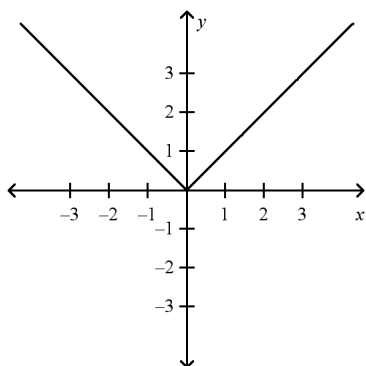
State the function family that fits each situation.

25. $y = 2x^2 + 3x - 1$

- a. linear b. quadratic c. cubic d. quartic

26. $y = e^x$

- a. logarithmic b. exponential c. quadratic d. inverse

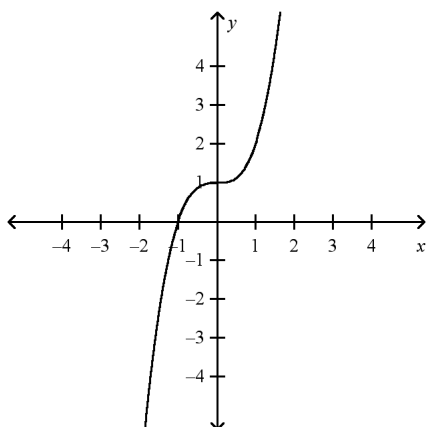


27.

- a. quadratic b. inverse c. absolute value d. linear

28. $y = x^4$

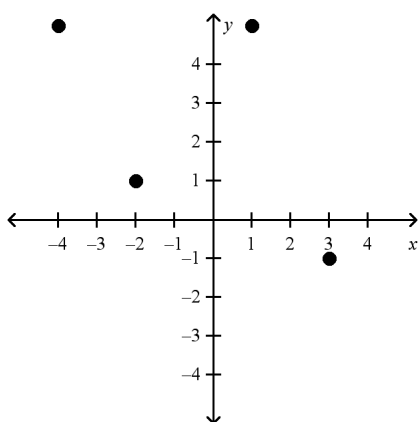
- a. Exponential b. Quartic c. Quadratic d. Cubic



29.

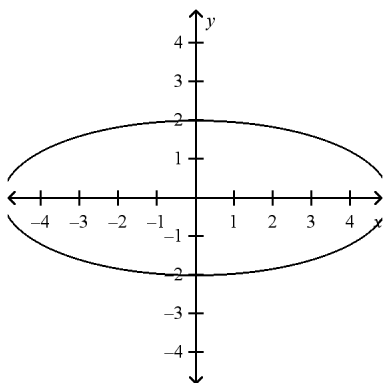
- a. Exponential b. Trigonometric c. Cubic d. Quartic

Are the following relations a function?



30.

- a. Yes, a function b. No, not a function



31.

a. Yes, a function

b. No, not a function

32. D R

$$\begin{bmatrix} -3 \\ 0 \\ 2 \\ 5 \end{bmatrix} \quad \begin{bmatrix} -5 \\ 2 \\ 4 \end{bmatrix}$$

a. Yes, a function

b. No, not a function

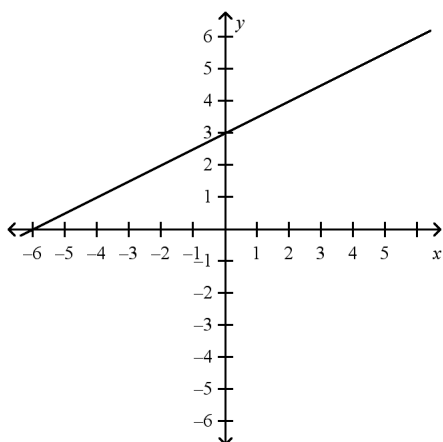
33. $\{(0,4), (3,5), (-4,-1), (2,7), (3,-2)\}$

a. Yes, a function

b. No, not a function

Give the domain and range of each function or relation.34. $\{(-4,4), (2,0), (2,6), (-1,5), (6,-3)\}$ a. $D: \{-4, -1, 2, 6\}$ b. $D: \{-3, 0, 4, 5, 6\}$ c. $D: \{-4, -3, -1\}$ d. $D: \{-4, -1, 2, 2, 6\}$
 $R: \{-3, 0, 4, 5, 6\}$ $R: \{-4, -1, 2, 6\}$ $R: \{0, 2, 4, 5, 6\}$ $R: \{-3, 4, 5, 6\}$
35. $y = 5x - 2$ a. $D: x \geq 0$
 $R: y \geq -2$ b. $D: x < 0$
 $R: y \geq -2$ c. $D: \text{all real numbers}$
 $R: \text{all real numbers}$ d. $D: \text{IDK}$
 $R: \text{IDK}$

Match the equation with the graph.



36.

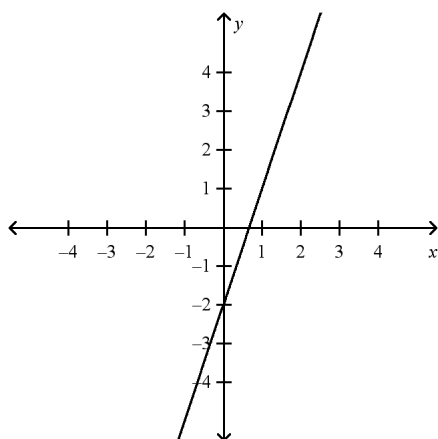
a. $y = \frac{1}{2}x - 6$

b. $y = 2x + 3$

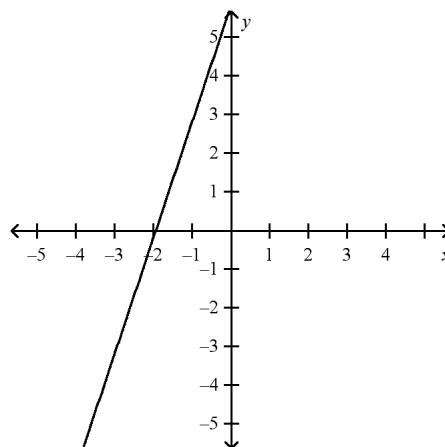
c. $y = \frac{1}{2}x + 3$

d. $y = -\frac{1}{2}x - 6$

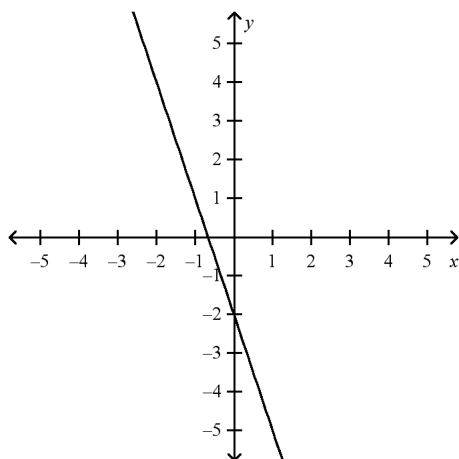
37. $y = 3x - 2$



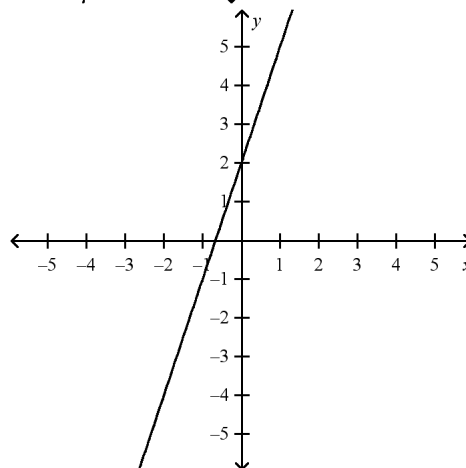
a.



c.

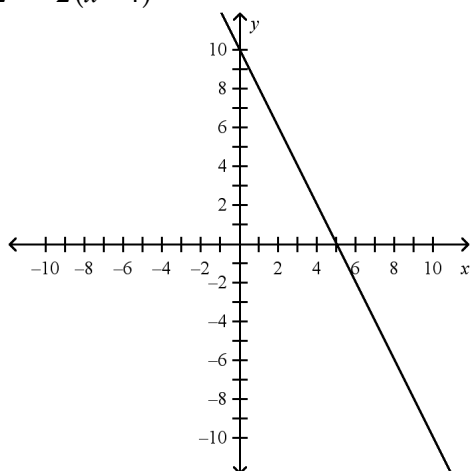


b.

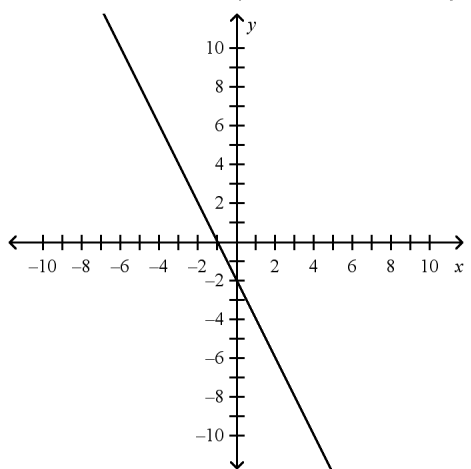


d.

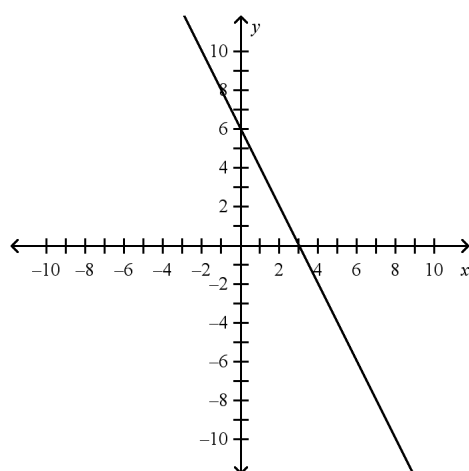
38. $y + 2 = -2(x - 4)$



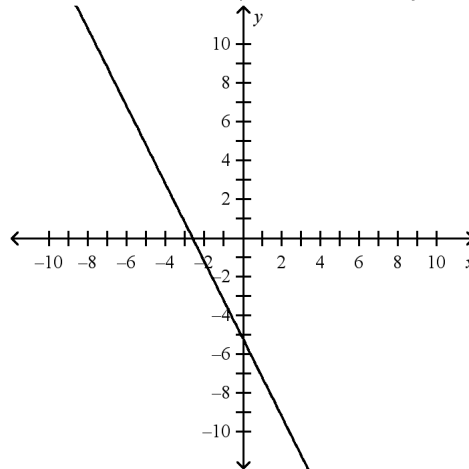
a.



b.



c.



d.

Simplify.

39. $\sqrt{96}$

a. $4\sqrt{6}$

b. $16\sqrt{6}$

c. $2\sqrt{6}$

d. $4\sqrt{12}$

40. $3\sqrt{20}$

a. $2\sqrt{5}$

b. $6\sqrt{5}$

c. $12\sqrt{5}$

d. $6\sqrt{10}$

41. $\sqrt{\frac{16}{25}}$

a. $\sqrt{\frac{4}{5}}$

b. $\frac{2\sqrt{8}}{5}$

c. $\frac{16}{25}$

d. $\frac{4}{5}$

Rationalize.

42. $\frac{8}{\sqrt{3}}$

a. $\frac{24}{\sqrt{3}}$

b. $\frac{8\sqrt{3}}{\sqrt{3}}$

c. $\frac{8\sqrt{3}}{3}$

d. $\frac{8}{3}$

Translate the following verbal expression into an algebraic expression:

43. Five less than the product of three and a number squared.

a. $3x^2 - 5$

b. $5 - 3x^2$

c. $(3 + x^2) - 5$

d. $\frac{x^2}{3} - 5$

44. Find $(f - g)(x)$ for

$f(x) = 10x^2 - 3x + 2$

$g(x) = 3x^2 - 4$

a. $13x^2 - 3x + 6$

b. $7x^2 - 3x + 6$

c. $7x^2 - 3x - 2$

d. $7x^2 + x + 6$

45. Find $(g - f)(x)$ for

$g(x) = 3x^2 - 4$

$f(x) = 10x^2 - 3x + 2$

a. $-7x^2 + 3x - 2$

b. $-7x^2 - 3x - 6$

c. $13x^2 + 3x - 2$

d. $-7x^2 + 3x - 6$

46. Give the equation that matches the table.

x	y
-2	-5
0	2
2	9
4	16

a. $y = \frac{7}{2}x + 2$

b. $y = \frac{2}{7}x + 2$

c. $y = -\frac{7}{2}x + 2$

d. $y = \frac{7}{2}x - 5$

Describe the transformation(s).

47. $y = 5x^2 + 3$

a. skinnier
shift up 3b. wider
shift up 3c. skinnier
shift right 3d. skinnier
shift down 3

48. $y = \frac{1}{5}(x-3)^2$

- a. Wider Shift left 3 b. Wider Shift right 3 c. Skinnier Shift up 3 d. Skinnier Shift right 3

Pick the answer that is NOT a transformation of the function.

49. $y = -\frac{1}{3}x^3 + 2$

- a. reflected b. shift up 2 c. wider d. shift right 2

50. $y = 6|x+4| - 1$

- a. steeper b. shift down 1 c. reflected d. shift left 4

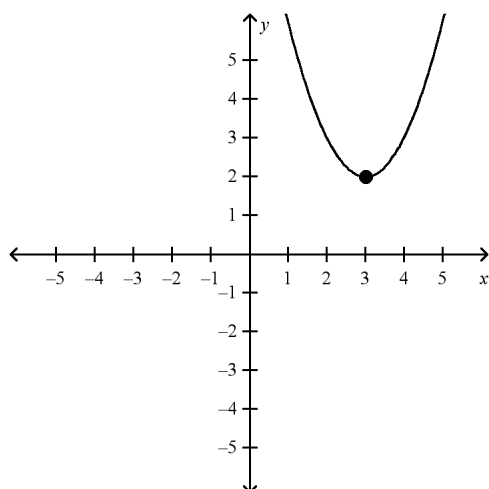
Find the axis of symmetry:

51. $y = x^2 - 6x + 1$

- a. A of S: $x = -3$ Vertex: $(-3, 28)$ b. A of S: $x = 6$ Vertex: $(6, 1)$ c. A of S: $x = -6$ Vertex: $(-6, -8)$ d. A of S: $x = 3$ Vertex: $(3, -8)$

52. $y = 3(x-5)^2 + 4$

- a. A of S: $x = 3$ Vertex: $(3, 4)$ b. A of S: $x = 5$ Vertex: $(5, 4)$ c. A of S: $x = -5$ Vertex: $(-5, 4)$ d. A of S: $x = 4$ Vertex: $(4, 3)$



53.

- a. A of S: $x = 3$ Vertex: $(3, 2)$ b. A of S: $x = 2$ Vertex: $(2, 3)$ c. A of S: $y = 3$ Vertex: $(3, 2)$ d. A of S: $x = -3$ Vertex: $(-3, 2)$

Algebra 2 MIDTERM - Quarter 3
Answer Section**MULTIPLE CHOICE**

- | | |
|------------|--------|
| 1. ANS: B | PTS: 1 |
| 2. ANS: C | PTS: 1 |
| 3. ANS: B | PTS: 1 |
| 4. ANS: C | PTS: 1 |
| 5. ANS: D | PTS: 1 |
| 6. ANS: A | PTS: 1 |
| 7. ANS: B | PTS: 1 |
| 8. ANS: B | PTS: 1 |
| 9. ANS: D | PTS: 1 |
| 10. ANS: B | PTS: 1 |
| 11. ANS: C | PTS: 1 |
| 12. ANS: A | PTS: 1 |
| 13. ANS: B | PTS: 1 |
| 14. ANS: A | PTS: 1 |
| 15. ANS: C | PTS: 1 |
| 16. ANS: D | PTS: 1 |
| 17. ANS: D | PTS: 1 |
| 18. ANS: B | PTS: 1 |
| 19. ANS: D | PTS: 1 |
| 20. ANS: A | PTS: 1 |
| 21. ANS: C | PTS: 1 |
| 22. ANS: D | PTS: 1 |
| 23. ANS: B | PTS: 1 |
| 24. ANS: C | PTS: 1 |
| 25. ANS: B | PTS: 1 |
| 26. ANS: B | PTS: 1 |
| 27. ANS: C | PTS: 1 |
| 28. ANS: B | PTS: 1 |
| 29. ANS: C | PTS: 1 |
| 30. ANS: A | PTS: 1 |
| 31. ANS: B | PTS: 1 |
| 32. ANS: A | PTS: 1 |
| 33. ANS: B | PTS: 1 |
| 34. ANS: A | PTS: 1 |
| 35. ANS: C | PTS: 1 |
| 36. ANS: C | PTS: 1 |
| 37. ANS: A | PTS: 1 |
| 38. ANS: B | PTS: 1 |
| 39. ANS: A | PTS: 1 |
| 40. ANS: B | PTS: 1 |

41.	ANS: D	PTS: 1
42.	ANS: C	PTS: 1
43.	ANS: A	PTS: 1
44.	ANS: B	PTS: 1
45.	ANS: D	PTS: 1
46.	ANS: A	PTS: 1
47.	ANS: A	PTS: 1
48.	ANS: B	PTS: 1
49.	ANS: D	PTS: 1
50.	ANS: C	PTS: 1
51.	ANS: D	PTS: 1
52.	ANS: B	PTS: 1
53.	ANS: A	PTS: 1